



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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GROUP 3600

Serial No.: 09/779,894

Filed: March 31, 2000

Title: CLOSURE MECHANISM AND METHOD
FOR SPENT NUCLEAR FUEL CANISTERS

Examiner: H.E. Behrend

Group Art Unit: 3641

Attorney Docket No.: S-90,669



Customer Number : 31972

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PATENT TRADEMARK OFFICE

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

ATTENTION: Board of Patent Appeals and Interferences

APPELLANTS' BRIEF UNDER 37 CFR 1.192

Appellants respectfully submit this Brief in support of their Appeal of Examiner's Final Rejection on August 22, 2003, of Claims 1-5 and 10-16. These are all of the claims remaining in the application.

I. REAL PARTY IN INTEREST

The real party in interest is the United States Government, as represented by the Department of Energy.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-5 and 10-16 - Under Appeal

Claims 6-9 - Withdrawn from Consideration.

IV. STATUS OF AMENDMENTS

There was no Amendment After Final Action. Examiner has responded to all amendments.

V. SUMMARY OF INVENTION

The invention is a canister(10) for spent nuclear fuel. The canister(10) includes a canister shell(32), a top shield plug(34) disposed within the canister(10) and a leak-tight closure arrangement. The closure arrangement includes a shear ring(30) mated with an annular recess(30a) in the canister shell(32). The shear ring(30) is welded to the canister shell (via weld 30) and to the top shield plug (via weld 31). An outer seal plate(36) is disposed above the shear ring(30) and is welded (via welds 35 and 37 respectively) to the shield plug(34) and the canister shell(32).

canister(10)	page 6, line 15
canister shell(32)	page 6, line 8
shield plug (34)	page 6, line 13
leak tight closure arrangement	page 3, lines 17-20
shear ring(30)	page 6, line 3
welds (35 and 37)	page 6, line 12
	page 7, lines 18-19,
	page 9, lines 11-12
annular recess(30a)	page 6, line 10
welds (31, 33)	page 6, lines 10-11
outer seal plate 36	page 6, line 12

VI. ISSUES

A. Claims 1, 5, 10, 15 and 16 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,636,645 to B.A. Kessinger.

B. Claims 2-4, 10-16 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,636,645 to B.A. Kessinger in view of Applicants' own admission of prior art in the specification or, in view of U.S. Patent 5,548,992 to B.H. Hallett, et al.

VII. GROUPING OF CLAIMS

Claims 1-5 and 10-14 are to be considered together.

Claims 15 and 16 are to be considered together.

A full response to the Final Rejection necessitates discussing some claims separately. The result is this grouping of claims.

In particular, Claims 15 and 16 have limitations that particularly distinguish them from the Kessinger patent. Therefore the rejection of these claims under 35 U.S.C. 102 must be discussed separately from the rejection of Claims 1-5 and 10-14.

VIII. ARGUMENTS

Rejection Under 35 U.S.C. 102(b):

Claims 1, 5, 10, 15 and 16

Claims 1, 5, 10 15 and 16 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,636,645 to B.A. Kessinger.

Examiner has stated that the shear ring reads on canopy element 80, which is welded to shield plug 72 at 84 and to the canister shell at 68. Cover 114 is welded to element 128 at edge 132. Element 128 is welded to the canister shell at lower edge 130.

Response

Examiner's rejection is based on the statement that shear ring 30 in the rejected claims reads on canopy element 80 in the Kessinger patent.

First issue: Does shear ring 30 in the rejected claims read on canopy element 80 in the Kessinger patent?

1. Examiner has based the rejection on the statement, "The shear ring reads on element 80". Applicants respectfully point out that it does not.

Attached is a copy of Appellants' Figures 3 and 4 showing shear ring 30. Also attached is a copy fo Kessinger's Figures 4 and 5 showing canopy element 80. The following is to be read in view of these figures.

Kessinger's element 80 is "canopy element 80". "Element 80 can be fabricated, for example, by sawing away the outer portion of a hoop of stainless steel tubing." (col. 4, lines 52-54). This is shown in Fig. 5. Note that canopy element 80 is bowed. Bowing provides flexibility.

A canopy element provides flexibility. In this application it is a flexible connector. Consistent with the function of providing flexibility, a canopy does not bear load. Instead, load is carried by another member. Kessinger discloses a canopy

made by sawing a tube in half and joining the ends to form a hoop. With reference to Kessinger's Fig. 5, a load applied from above would cause the canopy element 80 to bend.

A shear ring is ordinarily not flexible. Under load, a shear ring either retains its shape or fails by shearing. A shear ring is capable of bearing load. Under excess load, a shear ring fails by design. The shear ring provides a load path to guide the direction of shearing. Shearing does not provide flexibility. A shear ring either shears or does not shear. That is, a shear ring functions by either retaining its shape or by failing and breaching the ring.

A canopy is a flexible member that can be deformed and retain its integrity. A shear ring is a non-flexible member that either retains its shape or fails. Applicants respectfully point out that Kessinger's element 80 is a flexible canopy. The instant shear ring does not read on a flexible canopy.

Furthermore, attention is drawn to Kessinger's shear keys 88, 90. Shear keys are the element in the Kessinger patent that most closely reads on the instant shear ring. However, Kessinger's shear keys do not bear load in Fig. 4. Also, Kessinger's shear keys are not a containment boundary in the canister as distinguished from the instant shear ring. The shear keys are not held in place by welds.

2. The instant Claim 5 is particularly distinguished from the Kessinger patent. The instant application discloses shear ring 30 as load bearing. Kessinger's canopy element 80 is flexible and therefore inherently non-load bearing. Likewise, canopy element 80 cannot be used for lifting. Kessinger's shear keys 88, 90 are not attached to adjacent structural elements. Therefore they cannot be used for lifting.

In the instant invention, the annular recess 32a in cooperation with shear ring 30 allows for the canister to be picked up via a liter and bolts in bolt holes drilled in the shield plug. (page 4, lines 4-5).

Neither Kessinger's canopy element 80 nor shear keys 88, 90 provide for such lifting. Of course, Kessinger's container can be lifted, but only the application of a lifting force through bolt 122 and not through either shear keys 88, 90 or canopy element 80.

If bolt 122 were absent, the container could not be lifted via secondary cover 114. Shear keys 88, 90 do not facilitate

lifting. Furthermore canopy element 80 would not facilitate lifting because its function is to flex and deform.

Lifting is an important consideration for a spent fuel canister because it may be moved and its weight is in order of magnitude in tons.

3. Examiner makes no specific mention of the relevance of the Kessinger patent to Claim 10. Claim 10 further narrows the scope of Claims 1 and 4. Claim 1 has been shown to be novel. Accordingly, Claim 10 is novel as well.

Second issue: Does the Kessinger patent disclose every limitation in Claims 1, 5 and 10?

Claims 1 and 5 recite a "shear ring" as an essential element.

Neither Kessinger's canopy element 10 nor Kessinger's shear keys 88, 90 function as the instant shear ring does in a spent fuel canister. The Kessinger patent does not teach this essential limitation in the instant claims.

Also, Claim 1 recites, "weld means for welding the shear ring to said canister shell." This essential limitation is not found in Kessinger.

In order for a rejection under 35 U.S.C. 102(b) to be sustained, every limitation in the claim must be identified in the reference cited against it. Examiner's rejection does not identify two essential limitations. Accordingly, the rejection under 35 U.S.C. 102(b) cannot be sustained.

Third issue: Does the Kessinger patent disclose every limitation in Claims 15 and 16?

Two additional essential elements in Claims 15 and 16 are not disclosed in the Kessinger patent. These are in Claim 15, "a load bearing shear ring" and in Claim 16, the "shear ring is mated with an annular groove in the canister wall."

As stated above, neither Kessinger's canopy element 80 nor Kessinger's shear keys 88, 90 function as the instant shear ring does in a spent fuel canister.

Also, Kessinger's canopy element 80 does not mate with an annular groove in the canister wall. Kessinger's canopy element 80 extends into recess 76 in primary cover 72 (col. 4, lines 54-58). This is seen in Fig. 4.

Because of this structural arrangement, the Kessinger canopy element 80 is not "load bearing".

Claims 15 and 16 recite, "a load bearing shear ring" and the "shear ring is mated with an annular groove in the canister wall." These elements are not disclosed in the Kessinger patent.

In order for a rejection under 35 U.S.C. 102(b) to be sustained, every limitation in the claim must be identified in the reference cited against it. Examiner's rejection does not accomplish this. Accordingly, the rejection under 35 U.S.C. 102(b) cannot be sustained.

Examiner's Comments

In order to make a complete response and to avoid inadvertent acquiescence, Appellants respond to Examiner's comments as follows.

1. Examiner has stated, "it is not seen how applicant can properly argue that his shear ring is 'not flexible' especially since even applicant himself in the second paragraph on page 4 of the 6/5/03 response admits that shear rings can be flexible!"

Response: A shear ring is not ordinarily flexible, i.e., in the direction of shear. A shear ring can be specifically modified to be flexible. For example, a split ring shear ring has flexibility for installation. Once installed, i.e., in use, a split shear ring functions the same as a non-split shear ring. However, the only variation that Applicants disclose is multiple pieces welded together.

2. Examiner has stated, "none of the features argued by applicant for his alleged 'shear ring' are even disclosed in applicants' specification!"

Response: The term "shear ring" is well-known in the mechanical arts. Applicants rely on the well-known ordinary use of a shear ring in describing properties.

3. Examiner has stated, "The only feature that applicants own specification recites about 'shear ring' 30, is that it is a load bearing member (e.g., see page 9 of the specification). Thus, any ring which even partially bears a load would meet applicants' disclosed function (and claimed in claims 15 and 16) of a load bearing member. Kessinger in the sentence bridging cols. 5 and 6 states that element or ring 80 'accommodates minor movement of cover 72 with respect to mouth region 44 without unduly straining the welded seal.' This referred to movement of cover 72 present a 'load' on ring 80. Thus, ring 80 of Kessinger is considered to be a 'load bearing' element (as recited in applicants' claims 15 and 16)."

Response: When Kessinger states canopy element 80 "accommodates minor movement" it affirms that canopy element 80 is flexible. To suggest that this means that canopy element 80 is "load bearing" is to assert the opposite of what Kessinger explicitly states.

Rejection Under 35 U.S.C. 103(a):
Claims 2-4 and 10-16

Claims 2-4 and 10-16 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,636,645 to B.A. Kessinger in view of applicants' admission of prior art in the specification or in view of U.S. Patent 5,548,992 to B.H. Hallett, et al.

Examiner has stated that Claims 2 and 3 recite a multi-piece construction rather than a single unitary construction. Examiner states that applicant has admitted this to be an obvious modification. Examiner states that Claims 2 and 3 are further considered obvious in view of MPEP 2144.04, part V. Examiner states that as to claim 4, Kessinger shows the cover welded to the canister shell. Examiner states that it would have been prima facie obvious to have also welded the cover plate to the shield plug because such is no more than an art recognized conventional expedient. Examiner states further that it is conventional in the art and hence obvious from the teaching of Hallett, et al. or applicants' specification on page 6, lines 15+ to provide structure for leak testing.

Response:

Fourth issue: Does Examiner disclose how the Kessinger patent would be combined with the Hallett, et al. Patent and does the combination disclosed every limitation in the claims?

MPEP 706.12(j) requires Examiner "set forth in the Office Action: ... (B) the difference or differences in the claim over the applied reference(s), (C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter,"

Examiner does not set forth how the Kessinger patent and the Hallett, et al. patent are to be combined to arrive at the invention. Instead of an instruction of how to combine the references, Examiner makes multiple assertions including:

1. "further considered obvious in view of MPEP 2144.04, part V."
2. "it would have been prima facie obvious to have welded the cover plate to the shield plug"
3. "... no more than an art recognized conventional expedient."
4. "... it is conventional in the art and hence obvious ..."

We look at Kessinger's Figure 4 and Hallett's Figure (both Attached) and do not see an obvious way to combine the two. Next, we look at Examiner's four assertions for an instruction of how to make the combination. Still, we do not see that it can be accomplished.

We do not see how Hallett, et al. can be physically (in reality) combined with Kessinger's container. Examiner makes the combination metaphorically, (i.e., by combining words) without instruction. His stated justifications in combining these words are "prima facie obvious", "no more than ... conventional" and "obvious". However, Examiner's combination is not possible in the physical world without additional instruction. The Kessinger patent and the Hallett, et al. patent are not obviously combinable.

Examiner has not stated "the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter" required by MPEP 706.12(j).

Until Examiner sets forth what in the Kessinger patent is to

be combined with what in the Hallett, et al. patent and what modification would have to be effected to make the combination, the rejection is a variation of the omnibus rejection of a claim forbidden by MPEP 707.07(d).

A rejection on an omnibus rejection is improper and cannot be sustained.

Finally, as discussed above, the invention is distinguished in having essential elements not disclosed in the Kessinger patent. These essential elements are also not found in the Hallett, et al. patent. Therefore, though the two patents are not combinable, even a combined inventory of the elements in the two patents would not yield the invention.

Accordingly, the rejection under 35 U.S.C. 103(a) has been overcome.

Examiner's Comments

For the purpose of making a complete response and to avoid inadvertent acquiescence, Appellants respond to the Examiner's comments as follows.

1. Examiner has stated that Claims 2 and 3 recite a multi-piece construction rather than a single unitary construction. Examiner states that applicant has admitted this to be an obvious modification. Examiner states that Claims 2 and 3 are further considered obvious in view of MPEP 2144.04, part V.

Response: Examiner required an election of specie. In an Amendment filed August 12, 2002, Appellants stated, "A. Applicants provisionally elect specie S. Wherein the shear ring is a plurality of pieces welded together. Applicants make the election with traverse. One piece shear rings and multiple piece shear rings are known in the art as equivalents. Thus a search for one species will suffice for the other."

Examiner's reference to MPEP 2144.04, part V is not enlightening. We read MPEP 2144.04, part V to argue for patentability. Or, is Examiner making some other statement?

2. Examiner states that as to claim 4, Kessinger shows the cover welded to the canister shell. Examiner states that it would have been prima facie obvious to have also welded the cover plate to the shield plug because such is no more than

an art recognized conventional expedient.

Response: Examiner has cited two patents against the claims. Examiner's suggestion to weld the cover to the canister shell is reverse engineering. The assertion of "prima facie obvious" does not make up for the failure to find the invention in the prior art.

3. Examiner states further that it is conventional in the art and hence obvious from the teaching of Hallett, et al. or Applicants' specification (plate page 6 lines 15+) to provide structure for leak testing.

Response: Examiner states that it is conventional and hence obvious to provide "structure for leak testing". Examiner's states without statutory basis that there is no novelty in leak testing "structure". Examiner's bare statement is not a proper basis for rejecting the claims. Examiner's statement is not supportable and is on its face in error.

The PTO cannot support the proposition that the technology arts covering structure for leak testing are now closed and patents will no longer be granted for leak testing apparatus.

IX. APPENDIX OF CLAIMS UNDER APPEAL

Claim 1. (Original) A canister for storing, transporting, or disposing of spent nuclear fuel, said canister comprising a canister shell, a top shield plug disposed within said canister, and a leak-tight closure arrangement, said closure arrangement comprising:

a shear ring forming a containment boundary of said canister, and weld means for welding the shear ring to said canister shell and to said top shield plug.

Claim 2. (Original) The canister of claim 1 wherein said shear ring comprises a plurality of pieces welded together.

Claim 3. (Original) The canister of claim 1 wherein said shear ring comprises three pieces welded together.

Claim 4. (Original) The canister of claim 1 further comprising an outer seal plate disposed above said shear ring and welded to said shield plug and said canister.

Claim 5. (Original) The canister of claim 1, wherein said shear ring is used as the load bearing member and the welds are seal welds.

Claim 6. (Withdrawn) The canister of claim 1, wherein mating surface of the shear ring and the canister shell are tapered.

Claim 7. (Withdrawn) A method of providing a leaktight closure for a canister comprising a canister shell and a top shield plug, said method comprising:

welding a shear ring to said canister shell and to said top shield plug, supplying a test gas to the canister, welding an outer seal plate to the canister so as to seal the canister and create a space between the seal plate and the shield plug, sampling the air between the shield plug and the seal plate to test internal sealing of the canister, supplying a test gas to the space between the seal plate and shield plug, and testing the outer seal plate for leakage.

Claim 8. (Withdrawn) A method according to claim 7, wherein supplying a test gas to the canister comprises removing a pipe plug in the canister, filling the canister with helium and reinstalling the pipe plug after filling.

Claim 9. (Withdrawn) A method according to claim 7 wherein a test adapter is installed in the seal plate after welding of the seal plate and a mass spectrometer is connected to the adapter to sample the air between the shield plug and the seal plate.

Claim 10. (Previously presented) The canister of claim 4 further comprising a space for air or gas between said outer seal plate and said shield plug.

Claim 11. (Previously presented) The canister of claim 10 including leak testing components.

Claim 12. (Previously presented) The canister of claim 11 wherein said leak testing components comprise an L-shaped hole connected to a vertical channel in said shield plug, said channel communicating with the interior of said canister.

Claim 13. (Previously presented) The canister of claim 12 further comprising a pipe plug disposed in a vertical leg of said L-shaped hole.

Claim 14. (Previously presented) The canister of claim 13 further comprising an outer seal plate boss on said outer seal plate, a pipe plug in said outer seal plate boss, and a seal plug in said outer seal plate for sealing an opening in said seal plate.

Claim 15. (Previously presented) A spent nuclear fuel canister comprising a canister shell, a top shield plug disposed within the canister, and a leak-tight closure, the closure comprising:

a load bearing shear ring forming a containment boundary in the canister, and seal welds attaching the shear ring to the canister shell and to the top shield plug.

Claim 16. (Previously presented) The spent nuclear fuel canister of claim 15 wherein the shear ring is mated with an annular groove in the canister shell.

X. CONCLUSION

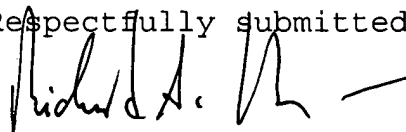
Appellants have responded point-on-point to each of the rejections. Appellants assert that the response overcomes all the rejections.

Allowance of Claims 1-5 and 10-16 is respectfully requested.

This New Brief is in response to the Notification Of Non-Compliance With 37 CFR 1.191(c) mailed 01/09/2004.

The Appeal Brief fee has previously been paid on 09/12/2003 with the original Appeal Brief.

Respectfully submitted,



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Dated: 19 February 2004

APPENDIX OF RELEVANT FIGURES

1. Applicants' SN 09/779,894, Figures 3 and 4.
2. Kessinger Figures 4 and 5.
3. Hallett et al. Figure.

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Applicants' SN 09/779,894

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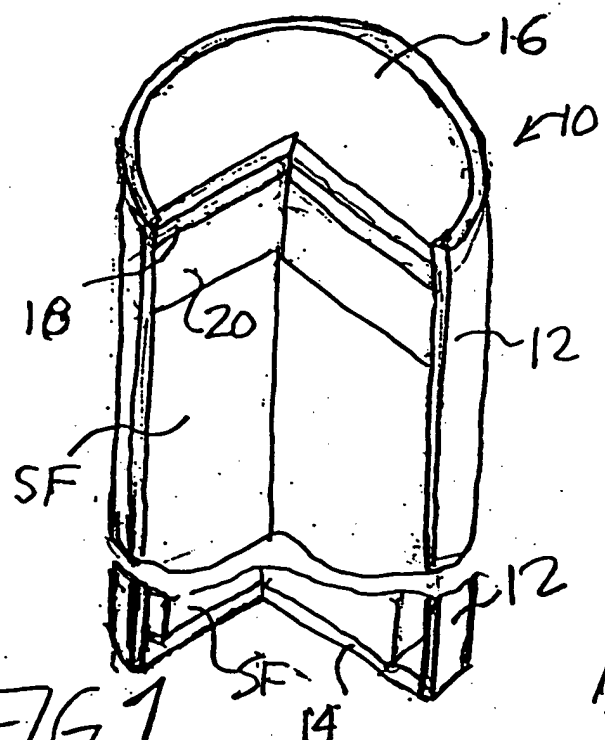


FIG. 1
PRIOR ART

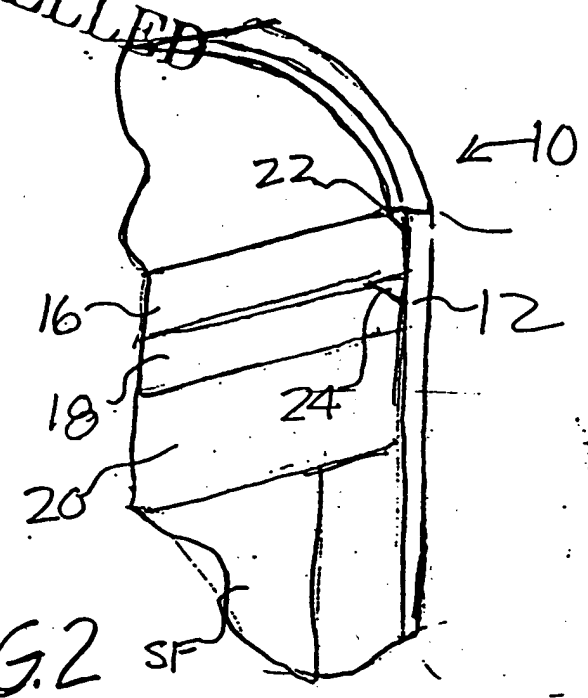


FIG. 2 SF
PRIOR ART

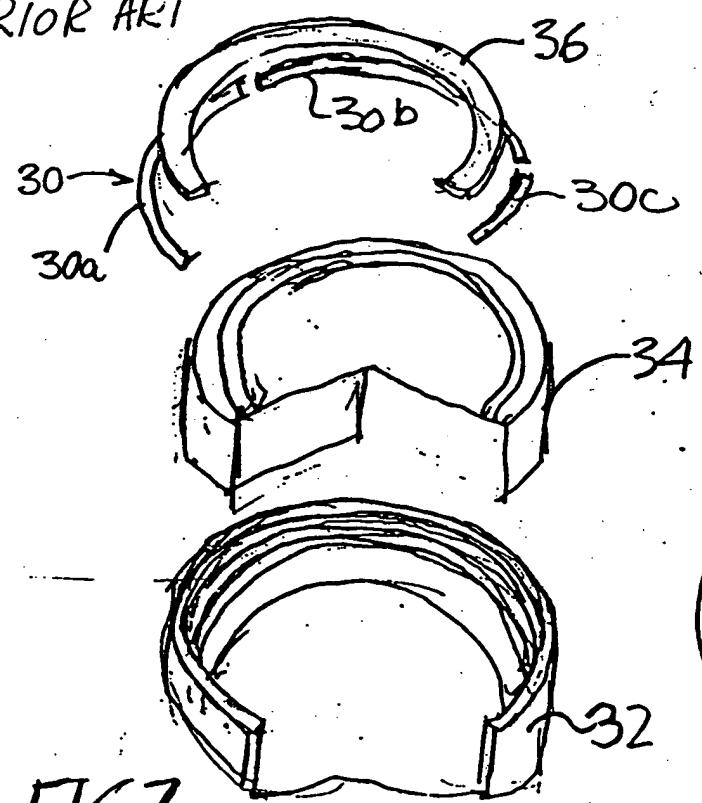


FIG. 3

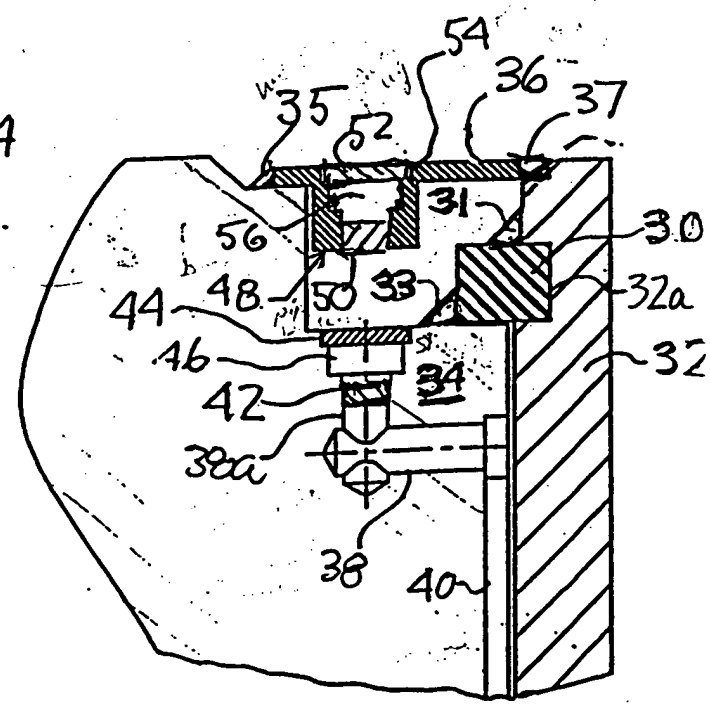


FIG. 4

NR DECLASSIFICATION REVIEW	
Reviewed by: <i>[Signature]</i>	Date: 4/23/02
Reviewed by: <i>[Signature]</i>	Date: 4/23/02
<input type="checkbox"/> Retain <input checked="" type="checkbox"/> Cancel <input type="checkbox"/> Class. changed to	

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FIG. 4.

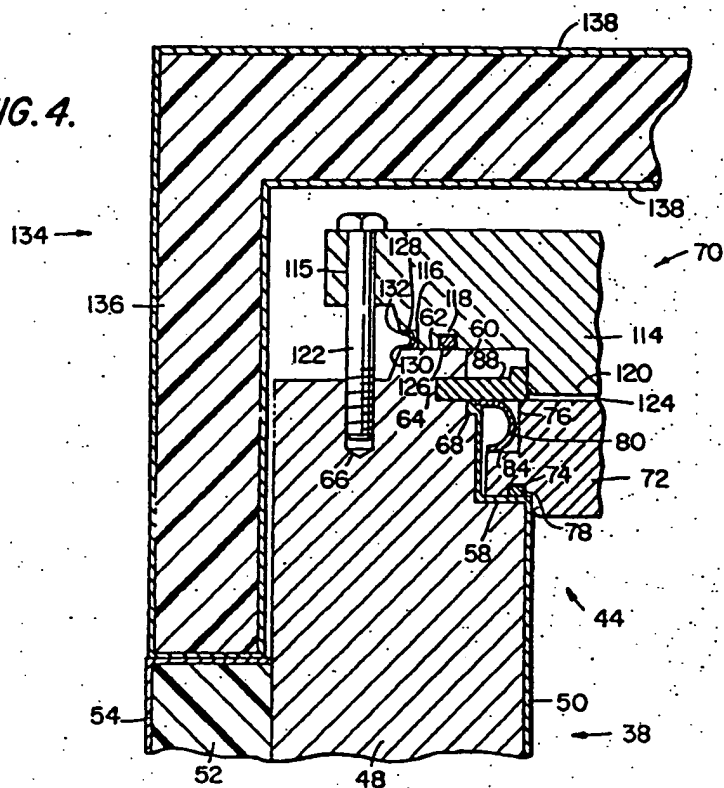
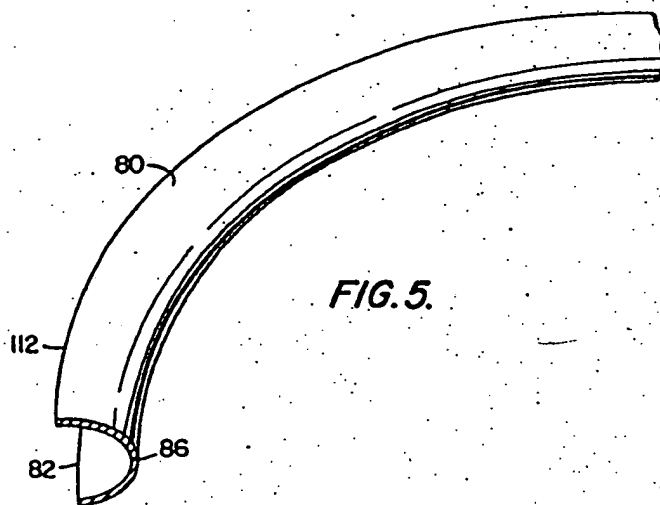


FIG. 5.





US005548992A

United States Patent [19][11] **Patent Number:** **5,548,992****Hallett et al.**[45] **Date of Patent:** **Aug. 27, 1996**[54] **LEAK TEST ADAPTER FOR CONTAINERS**

3,995,473 12/1976 Flaman et al. 73/49.2

[75] **Inventors:** Brian H. Hallett, Elizabeth; Michael S. Hartley, Canonsburg, both of Pa.**FOREIGN PATENT DOCUMENTS**

280953 1/1971 U.S.S.R. 73/49.2

1479685 7/1977 United Kingdom 73/49.2

[73] **Assignee:** The United States of America as represented by the United States Department of Energy, Washington, D.C.*Primary Examiner*—Hezron B. Williams*Assistant Examiner*—Daniel S. Larkin*Attorney, Agent, or Firm*—Thomas Zack; William R. Moser; Paul A. Gutlieb[21] **Appl. No.:** 487,718[22] **Filed:** Jun. 6, 1995[51] **Int. Cl.⁶** G01M 3/02; G01M 3/20[52] **U.S. Cl.** 73/49.2; 73/40.7; 73/49.8; 73/40[58] **Field of Search** 73/49.2, 49.8, 73/52, 49.3, 40.7, 40, 37[56] **References Cited****U.S. PATENT DOCUMENTS**

2,414,113 1/1947 Mapes 73/49.8

ABSTRACT

An adapter is provided for facilitating the charging of containers and leak testing penetration areas. The adapter comprises an adapter body and stem which are secured to the container's penetration areas. The container is then pressurized with a tracer gas. Manipulating the adapter stem installs a penetration plug allowing the adapter to be removed and the penetration to be leak tested with a mass spectrometer. Additionally, a method is provided for using the adapter.

19 Claims, 1 Drawing Sheet